

Things That Work!

Tested by Home Power

Solar Dynamics True-Sine Harvester

Joe Schwartz

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In recent years, there's been a proliferation of the use of portable, electronic devices in the U.S.—cell phones, laptops, PDAs, digital cameras, video cameras, MP3 players, and CD players. The list goes on and on. All of these devices rely on electricity, either directly or via batteries. Solar Dynamics manufactures the Harvester product line—portable PV power plants that will power up your portables and charge their batteries with sunshine.

Product Overview

The Harvester is a complete PV system that's built up on a frame resembling a hand truck. It's designed for portability. The unit's power center includes a Concorde 12 volt, 104 amp-hour (24 hour rate) sealed, absorbed glass mat (AGM) battery. We tested the True-Sine Harvester, which includes a 600 watt Exeltech XP600 inverter. The AC power quality of this inverter is excellent, and is well suited for powering consumer electronics. (Check out the Things that Work! review of the XP600's big brother, the XP1100, in *HP75*.) A 12 amp, pulse width modulated (PWM) Steca

Jota charge controller with LCD display and integrated temperature sensor regulates battery charging. All these components are housed in a weather resistant enclosure.

The Steca charge controller's LCD display shows PV current, DC load current, battery voltage, and battery state of charge (SOC) based on voltage. Two LED battery status indicators also provide system SOC information. The charge controller's display is on top of the power center unit, and easy to see. It also has a low voltage disconnect feature, just in case you lose track of the SOC.



The power center rests in a powder-coated tubular steel frame. A 50 W rated, ASE crystalline PV provides charge current. Some additional tubing, and a handle attached to the PV, make up the rest of the unit's frame. A pair of 12 inch (30 cm) wheels with knobby tires makes moving the Harvester easy, even over rough ground.

The portability of the unit allows for manual tracking of the sun's daily path. The tilt angle of the module is adjustable as well. The retail cost of the True-Sine Harvester we tested is US\$1,985. The unit carries a one-year warranty.

Documentation & Setup

The Harvester's documentation includes a 28 page manual, a laminated, quick setup sheet, and individual manuals for both the inverter and charge controller that are incorporated into the unit. In a world filled with marginal manuals, I'd rate the Harvester manual as superb (even with the typos). It contains step-by-step setup graphics, text, an appliance run time table, and more.

First time setup of the unit took a leisurely half hour. By the time my morning cup of coffee was gone, the Harvester was collecting sunshine. The unit is designed for the consumer market, and the simplicity of assembly reflects this.

Connectivity

The back of the power center has two DC input receptacles. A weather resistant, polarized receptacle and cable assures correct polarity between the positive and negative PV leads and the charge controller. An automotive cigarette lighter style receptacle accepts DC input from the optional 10 amp, AC-to-DC charger available from Solar Dynamics, or directly from a running automobile or other DC power source.

The power center has four, DC output receptacles—two cigarette lighter style and two polarized RV style. These receptacles are handy for running DC appliances and recharging cell phones, laptops, rechargeable batteries, and the like. The addition of an adjustable DC-to-DC converter will allow you to power DC loads directly at 3, 6, or 9 VDC.

The Exeltech XP600 has two grounded receptacles for AC output. You have to remember to shut off the inverter if you're not powering AC loads at the time. A nice addition to the AC output of the inverter would be a search mode. This would allow the inverter to power down when no AC loads are present, and would help conserve the limited energy stored in the Harvester's battery.

Goin' Mobile

The Harvester will fit into the trunk or back seat of most vehicles. The dimensions of the Harvester power



center are 21 by 10 by 20 inches (53 x 25 x 51 cm). Fully deployed, the Harvester PV module, frame, wheels, and power center measure 49 by 26 by 23 inches (124 x 66 x 58 cm).

The power center simply unplugs from the PV module and framework, allowing it to be moved or loaded separately. The power center is heavy, at 75 pounds (34 kg). The rest of the unit's PV and frame assembly weighs 42 pounds (19 kg). Your ability to lift the unit should be considered if you'll be loading it into a vehicle on a regular basis.

Because the battery used in the unit is sealed, the Harvester is classified as nonhazardous. It can be loaded on an airplane and set up at the base camp of your next adventure.

Flat Tire Trip

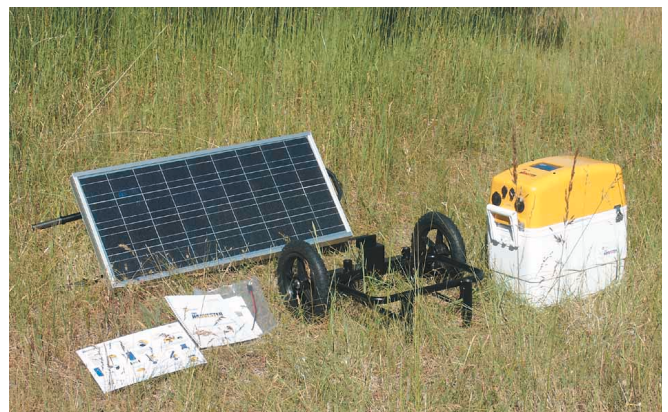
After hauling the Harvester around for a couple of months, both the tires began deflating. I scratched my head a bit, since the pressure loss was equal in both tires. I checked for punctures and didn't find any.

It turned out that the tires used on the Harvesters weren't holding their pressure for the long term. The manufacturer has resolved the issue by going to a urethane "flat-free" tire.

You Have Options

Several additional Harvester models are available. It can be purchased with a modified square wave inverter. Export versions with 230 volt, 50 Hz, AC output are also

All the Harvester's parts can be assembled in a leisurely half-hour.





A 600 watt Exeltech inverter provides high quality power. The AGM battery is housed below in an insulated space.

available. Other options include a three-module unit for increased PV charging, a portable field office option that adds a work table to the unit's frame, and lighting and message display versions.

Depending on your application and typical usage of the Harvester, Solar Dynamics can set you up with AC and DC battery chargers to supplement PV charging. One option is a 10 amp, DC, bulk battery charger. The charger plugs into a 120 VAC receptacle. Another optional accessory is an automotive charging cable. The cable is 12 feet (3.6 m) long, fused, and equipped with two, male cigarette lighter style adapters. This setup allows you to charge the power center off your rig's alternator while you drive. Once either end is plugged into a power source, the other end becomes "hot," so pay attention if you use this cable.

Run Times

So what will the Harvester run? I've been using the Harvester up on a piece of undeveloped, off-grid property outside of Ashland, Oregon. I've had the Harvester power both AC and DC compact fluorescent lighting, a CD boom box, a battery charger for various portables, a notebook computer, and even a Starband satellite Internet modem.

I've been running the majority of my loads off the DC side of the unit, in an effort to eliminate the inverter inefficiencies from the energy equation. The use of all these devices is intermittent, and the loads can be easily switched to other PV charging systems when the Harvester's battery reaches a 50 percent state of charge (SOC).

Harvester run times will vary depending on the power requirements of specific appliances, ambient temperature, sunlight, and whether the loads are running on AC or DC. In general, make sure to use efficient appliances, and when possible, power appliances directly off of DC. The Harvester manual contains a table that lists sample run times for various appliances.

Sweet Product

The True-Sine Harvester is the nicest, all-in-one PV charging station I've had my hands on. It uses great components, is well built, easy to move, and simple for nontechnical folks to operate. If you're interested in a small, portable PV system, and don't want to build it yourself, check it out.

Access

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Things that Work! Criteria

The products reviewed in Things that Work! must meet three criteria:

1. The product must meet its manufacturer's specifications.
2. The product must be durable and last in actual service.
3. The product must offer good value for the money spent on it.

The reviewed equipment is not necessarily the best product for all applications.



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